

### ABSTRACT OF THE DISCLOSURE

A diffusion furnace includes a support member, a process chamber, a sealing member for sealing from the process chamber the outside, and a cooling system for cooling the sealing member. The process chamber is installed on the support member, and the sealing member is  
5 inserted between the support member and the chamber. The cooling system has a first fluid passage and a second fluid passage. The first and second fluid passages are formed in the support member. A first fluid flows in the first fluid passage to cool the sealing member, and a second fluid flows in the second fluid passage to cool the sealing member when the supply of the first fluid is interrupted. With the present invention, cooling water and a coolant can  
10 be prevented from being mixed together. Therefore, it is possible to prevent the contamination of an apparatus and the waste of expensive cooling water.